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Does the Method of Sternal Repair Influence Long-Term Outcome in Management of Treated Mediastinitis?

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Introduction: Postoperative mediastinitis (POM) remains a dreaded complication of cardiac surgery, reducing early and long-term survival. Current management of POM is based on sternal debridement, eradication of infection, and definitive sternal reconstruction, often by various flap techniques. Despite previous studies demonstrating improved short-term results with omental flap (OF) repair as compared with muscle flaps (MF), no consensus for definitive sternal reconstruction exists. We reviewed our management of POM and evaluated the impact of different flap repair types on long-term survival.

Methods: Records of 222 adult patients status post cardiac surgery with POM were reviewed (1994-2008). Superficial infections and sternal nonunions were excluded. Management principles included sternal debridement, targeted antibiotic coverage, and sternal reconstruction by various methods. Three groups were evaluated based on method of sternal repair: MF (n = 96), OF (n = 65), and secondary sternal closure (n = 61). Control of mediastinal infection was augmented with negative pressure therapy (NPT) in 73 patients. Intergroup comparisons were performed with ANOVA. Multivariable Cox proportional-hazards regression analysis assessed the impact of demographics, perioperative details, and different methods of closure on long-term survival.

Results: Demographics, perioperative details, and POM presentations were similar between groups. The most common wound isolates were methicillin-resistant *S. aureus* (29.7%), methicillin-sensitive *S. aureus* (29.7%), Gram-negative rods (15.3%), and coagulase-negative staph (9.9%) and were not significantly different between groups. Those undergoing secondary sternal closure were managed with NPT significantly more often ($p < 0.0001$) and were discharged from hospital faster than PF or OF groups ($p = 0.014$). Recurrence of wound complications was significantly more common among the PF group ($p = 0.006$). POM management with NPT significantly improved survival compared with no NPT ($p = 0.008$). Heart failure, sepsis, age > 65 years, and peripheral vascular disease were independent predictors of mortality. Survival was similar between groups based on method of sternal closure ($n = 0.81$).

Conclusions: Few studies have examined factors associated with POM-related mortality. This study demonstrates that POM management protocols incorporating NPT to control mediastinal infection allows secondary sternal repair more commonly and improves long-term survival. PF repair was associated with higher rates of recurrent wound complications, but survival was not influenced by sternal repair method. Different techniques for sternal reconstruction in POM may be considered without regard for impact on long-term survival.